03.01-1/18/93-02661

Baker

Baker Environmental, Inc.
Airport Office Park, Building 3
420 Rouser Road
Coraopolis, Pennsylvania 15108

(412) 269-6000
FAX (412) 269-2002

January 18, 1993

Commanding Officer
Atlantic Division
Naval Facilities Engineering Command
Building N-26, Naval Station
Norfolk, Virginia 23511-6287

Attn: Mr. Byron Brant, P.E.
Code 1823

Re: Contract N62470-89-D-4814
Navy CLEAN District III
Contract Task Order (CTO) 0133
Investigation-Derived Waste Summary and Recommendations

Dear Mr. Brant:

Investigation-derived wastes (IDW) were generated during the recent field investigations at Sites 6, 9, and 48 located at Marine Corps Base (MCB) Camp Lejeune and New River Marine Corps Air Station (MCAS) in Jacksonville, North Carolina. These IDW included soil cuttings and drilling mud (solids), well development and purge water, and decontamination fluids (liquids). Presently, the solids are being stored in five, 20 cubic yard roll-off boxes and the liquids are being stored in a tanker truck, steel tanks, and steel 55-gallon drums. Both the liquids and solids are being stored within Storage Lot 203 at Site 6. Table 1 provides a summary of the various IDW and estimated volumes.

On November 10, 1992, samples were collected from the various IDW streams for laboratory analysis. For the solids, a single composite sample (composed of three grab samples from each roll-off box) was submitted for analysis of full Toxicity Characteristic Leaching Procedure (TCLP) compounds and the Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics of of ignitability, corrosivity, and reactivity. These analyses were selected based on soil disposal requirements.

Liquid wastes were first segregated into four groups prior to sampling. These groups are defined as follows:

- Group 1 - Potentially noncontaminated groundwater from Site 6 shallow wells, deep wells 6GW2D and 6GW7D, and all Site 9 and Site 48 wells.

- Group 2 - Potentially contaminated groundwater from Site 6 deep wells 6GW1D, 6GW27D, and 6GW28D.

- Group 3 - Excess water pumped from drums containing drilling mud and from roll-off boxes.

- Group 4 - Decontamination fluids consisting of Alconox soap solution, water, isopropanol alcohol, and 10 percent nitric acid.

Segregation of water was based on field observations and screening techniques (i.e., photoionization meter readings, odor and appearance). The four samples were analyzed for full Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics in accordance with CLP protocols. These parameters are the same as those analyzed during the groundwater investigation.

Table 2 compares the analytical results against the contaminants applicable to identify the wastes as potentially hazardous by characteristic under RCRA for purposes of proper handling and disposal. Tables 3 and 4 summarize the organic and inorganic contaminants detected in the liquid IDW samples, respectively. The results provided on Tables 3 and 4 may be useful to the TSD to determine appropriate treatment and disposal options.

CONCLUSIONS AND RECOMMENDATIONS - SOLID IDW

Composite sample 6-RBC analysis from the roll-off boxes did not exhibit any contaminant at levels which exceed the regulatory level as defined by RCRA. Therefore, the soil is not a hazardous waste by characteristic.

Based on the analytical results of the IDW solids, several disposal alternatives are available. These alternatives include on-site disposal, off-site disposal in an "industrial" type landfill or treatment at a licensed treatment, storage, and disposal (TSD) facility. The most feasible option, however, is to return the solid wastes to the site. This alternative is acceptable (and encouraged) at Superfund sites per U. S. Environmental Protection Agency (EPA) Management of IDW Guidelines (see Attachment 1). If this option is approved, the soil could be disposed of within Storage Lot 203 where it is presently being stored.

CONCLUSIONS AND RECOMMENDATIONS - LIQUID IDW

Concentrations of several organics and inorganics were detected in all four water samples. Organic constituents detected included acetone, trichloroethene (TCE), 1,2-dichloroethene, 2-methylnaphthalene, bis (2-ethylhexyl) phthalate, and 4,4'-DDD. Inorganic constituents detected included 20 different metals and cyanide. Groups 1, 3, and 4 IDW liquids are not hazardous by characteristic; however, Groups 3 and 4 IDW liquids exhibited organic and inorganic contamination above drinking water standards (see Tables 3 and 4). Group 1 IDW liquids are considered "clean" since no contaminants were detected above Federal or State drinking water standards. Group 2 IDW liquids are hazardous since TCE levels exceed the RCRA regulatory level of 5.0 mg/l (see Table 2).

As discussed above, three of the four groups (approximately 3,200 gallons total from Groups 2, 3, and 4) contained organic and inorganic constituents. A recent telephone conversation with Mr. Thomas Morris, of the Camp Lejeune Environmental Management

Department (EMD), indicated that these wastes could not be discharged into any of the base wastewater treatment systems for disposal. Therefore, it is recommended that these wastes be removed from the site via a vacuum truck and transported to a licensed TSD facility. For Group 1 (approximately 5,000 gallons), which exhibited only low levels of acetone, the wastes can be transported to a base wastewater treatment system for disposal since these liquids are not hazardous, nor contain elevated levels of organics or inorganics. This activity can be performed during the next phase of the field investigation scheduled in February. Once this tanker has been emptied, it can be reused for storage of water generated during the expanded deep groundwater investigation.

Baker is currently obtaining estimates for transporting and disposing the IDWs. Because these costs are not included in the original estimate, a modification to the CTO budget will be necessary. Labor costs associated with coordinating and managing these efforts are not reflected in the current budget. Baker will begin efforts to dispose of these wastes upon written authorization to proceed.

If you have any questions, please do not hesitate to contact me at (412) 269-2016.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Raymond P. Wattras

Raymond P. Wattras
Project Manager

RPW/REB/lmn
Attachments

cc: Mr. George Radford (MCB Camp Lejeune)
Ms. Lee Anne Rapp (w/o attachment)
Mr. Keith Simmons (w/o attachment)

TABLE 1

SUMMARY OF INVESTIGATION-DERIVED WASTES AND ESTIMATED VOLUMES

Sample Number	Medium	Group(1)	Quantities	Containment	Estimated Volume	Total Estimated Volume per Group
6-RBC	Solids	NA(2)	5	Roll-Off Boxes	90 cubic yards	90 cubic yards
6-WW1	Liquids	1	1 1 3(3)	Tanker Truck Steel Tank Steel 55-gallon Drums	5,000 gallons 500 gallons 140 gallons	5,640 gallons
6-WW2	Liquids	2	1 1	Steel Tank Steel Tank	1,000 gallons 500 gallons	1,500 gallons
6-WW3	Liquids	3	24	Steel 55-gallon Drums	1,100 gallons	1,100 gallons
6WW4	Liquids	4	11	Steel 55-gallon Drums	600 gallons	600 gallons

Notes: (1) Groups are defined for liquids by contamination potential and content.
Group 1 - potentially non-contaminated water
Group 2 - potentially contaminated water
Group 3 - excess water pumped from drums containing drilling mud
Group 4 - decontamination fluids

(2) NA - Not Applicable; roll-off box sample

(3) 55-gallon drums not filled to capacity.

TABLE 2

COMPARISON OF ANALYTICAL RESULTS AGAINST RCRA HAZARDOUS WASTE CHARACTERISTIC PARAMETERS

EPA HW No.	Contaminant	Regulatory Level (mg/L)	6-RBC(1) (mg/L)	6-WW1(2)(3) (mg/L)	6-WW2(2)(4) (mg/L)	6-WW3(2) (mg/L)	6-WW4(2)(5) (mg/L)
D004	Arsenic	5.0	0.04U	0.003U	0.005U	0.0513	0.0121
D005	Barium	100.0	0.264	0.0246	0.072	0.519	0.205
D018	Benzene	0.5	0.005U	0.1U	1.0U	0.01U	5.0U
D006	Cadmium	1.0	0.0026	0.0019U	0.002	0.0099U	0.006
D019	Carbon tetrachloride	0.5	0.005U	0.1U	1.0U	0.01U	5.0U
D020	Chlordane	0.03	0.00017U	0.00005U	0.00005U	0.00005U	0.00005U
D021	Chlorobenzene	100.0	0.005U	0.1U	1.0U	0.01U	5.0U
D022	Chloroform	6.0	0.005U	0.1U	1.0U	0.01U	5.0U
D007	Chromium	5.0	0.0055	0.0036U	0.0275	0.303	0.158
D026	Cresol	200.0	0.033U	NA	NA	NA	NA
D016	2,4-D	10.0	0.033U	NA	NA	NA	NA
D027	1,4-Dichlorobenzene	7.5	0.033U	0.01U	0.01U	0.01U	0.05U
D028	1,2-Dichloroethane	0.5	0.005U	0.1U	1.0U	0.01U	5.0U
D029	1,1-Dichloroethylene	0.7	0.005U	0.1U	1.0U	0.01U	5.0U
D030	2,4-Dinitrotoluene	0.13	0.033U	0.01U	0.01U	0.01U	0.05U
D012	Endrin	0.02	0.00033U	0.0001U	0.0001U	0.0001U	0.00001U
D031	Heptachlor (and its epoxide)	0.008	0.00017U	0.00005U	0.00005U	0.00005U	0.00005U
D032	Hexachlorobenzene	0.13	0.033U	0.01U	0.01U	0.01U	0.05U
D033	Hexachlorobutadiene	0.5	0.033U	0.01U	0.01U	0.01U	0.05U
D034	Hexachloroethane	3.0	0.033U	0.01U	0.01U	0.01U	0.05U
D008	Lead	5.0	0.022U	0.0033	0.0074U	0.242	0.12
D013	Lindane	0.4	0.00017U	0.00005U	0.00005U	0.00005U	0.00005U
D009	Mercury	0.2	0.00004U	0.00004U	0.00004U	0.00011	0.00022

TABLE 2

COMPARISON OF ANALYTICAL RESULTS AGAINST RCRA HAZARDOUS WASTE CHARACTERISTIC PARAMETERS

EPA HW No.	Contaminant	Regulatory Level (mg/L)	6-RBC(1) (mg/L)	6-WW1(2)(3) (mg/L)	6-WW2(2)(4) (mg/L)	6-WW3(2) (mg/L)	6-WW4(2)(5) (mg/L)
D014	Methoxychlor	10.0	0.0017U	0.0005U	0.0005U	0.0005U	0.0005U
D035	Methyl ethyl ketone	200.0	0.01U	0.1U	1.0U	0.01U	5.0U
D036	Nitrobenzene	2.0	0.033U	0.01U	0.01U	0.01U	0.05U
D037	Pentchlorophenol	100.0	0.083U	0.025U	0.025U	0.025U	0.12U
D038	Pyridine	5.0	0.033U	NA	NA	NA	NA
D010	Selenium	1.0	0.257	0.005U	0.005U	0.025U	0.025U
D011	Silver	5.0	0.002U	0.002U	0.002U	0.002U	0.002U
D039	Tetrachloroethylene	0.7	0.005U	0.1U	1.0U	0.01U	5.0U
D015	Toxaphene	0.5	0.017U	0.005U	0.005U	0.005U	0.005U
D040	Trichloroethylene (TCE)	0.5	0.005U	0.1U	13	0.11	5.0U
D041	2,4,5-Trichlorophenol	400.0	0.083U	0.025U	0.025U	0.025U	0.12U
D042	2,4,6-Trichlorophenol	2.0	0.033U	0.01U	0.01U	0.01U	0.05U
D017	2,4,5-TP (Silvex)	1.0	0.1U	NA	NA	NA	NA
D043	Vinyl Chloride	0.2	0.01U	0.1U	1.0U	0.01U	5.0U
D001	Ignitability	FP <120°	>200°F	NA	NA	NA	NA
D002	Corrosivity	pH ≤2 or ≥12.5	9.52	NA	NA	NA	NA
D003	Reactivity	40 CFR 261.23					
	Sulfide (mg/kg)		3.0U	NA	NA	NA	NA
	Cyanide (mg/kg)		0.6U	NA	NA	NA	NA

(1) Analyzed for Full TCLP and RCRA Hazardous Waste Characteristics.
(2) Samples analyzed for Full TCL Organics/TAL Inorganics per CLP procedures.
(3) Volatile organic fraction analyzed at 10x dilution.
(4) Volatile organic fraction analyzed at 100x dilution.
(5) Volatile organic fraction analyzed at 500x dilution.

U - Not detected at Contract Required Quantitation Limit (CRQL).
NA - Not Analyzed

TABLE 3

ORGANIC COMPOUNDS DETECTED IN INVESTIGATION DERIVED WASTE SAMPLES

Sample Number	Medium	Group	Volatile Organics			Semivolatile Organics		Pesticide Organics
			Acetone	Trichloro-ethene	1,2-Dichloro-ethene (total)	2-methyl-naphthalene	bis (2-ethylhexyl) phthalate	4,4'-DDD
6-WW1	Liquids	1	930	--	--	--	--	--
6-WW2	Liquids	2	--	13,000	--	--	--	--
6-WW3	Liquids	3	36	110	47	--	--	0.171
6WW4	Liquids	4	44,000	--	--	98	76	--

Notes: (1) -- Denotes not detected at Contract Required Quantitation Level (CRQL)

Results shown in micrograms per liter (µg/L).
Note: Only contaminants detected above CRQL are listed.

TABLE 4

INORGANIC COMPOUNDS DETECTED IN INVESTIGATION DERIVED WASTE SAMPLES

Sample Number	Medium	Group	Inorganic Constituents									
			Beryllium	Barium	Selenium	Aluminum	Arsenic	Cadmium	Calcium	Chromium	Copper	Iron
6-WW1	Liquids	1	--	--	--	5,140	--	--	36,200	--	--	2,630
6-WW2	Liquids	2	--	--	--	9,480	--	--	137,000	27.5	--	12,800
6-WW3	Liquids	3	7.2	519	--	112,000	51.3	9.9	825,000	303	83.1	92,100
6WW4	Liquids	4	--	205	--	87,100	12.1	6.0	39,800	158	76.2	233,000

Notes: (1) -- Denotes not detected at Contract Required Quantitation Level (CRQL)

Results shown in micrograms per liter (µg/L).
Note: Only contaminants detected above CRQL are listed.

TABLE 4 (Continued)

INORGANIC COMPOUNDS DETECTED IN INVESTIGATION DERIVED WASTE SAMPLES

Sample Number	Medium	Group	Inorganic Constituents										
			Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Sodium	Vanadium	Zinc	Cyanide	pH (S.U.)
6-WW1	Liquids	1	3.3	--	49.9	--	--	5,240	21,700	--	--	--	7.6
6-WW2	Liquids	2	7.4	5,150	172	--	--	6,320	16,800	--	81	--	7.6
6-WW3	Liquids	3	242	48,000	838	--	62.8	26,300	102,000	246	929	--	10.0
6WW4	Liquids	4	120	--	1,430	0.22	102	27,800	52,100	108	598	65.5	4.5

Notes: (1) -- Denotes not detected at Contract Required Quantitation Level (CRQL)

Results shown in micrograms per liter (µg/L).
Note: Only contaminants detected above CRQL are listed.

ATTACHMENT 1

GUIDE TO MANAGEMENT OF INVESTIGATION DERVIED WASTES

United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | Publication: 9345.3-03FS April 1992

EPA

Guide to Management of Investigation-Derived Wastes

Office of Emergency and Remedial Response
Hazardous Site Control Division OS-220W

Quick Reference Fact Sheet

CERCLA field investigation activities (e.g., remedial investigation/feasibility studies and remedial designs) may result in the generation of waste materials that may pose a risk to human health and the environment. These investigation-derived wastes (IDW) may include drilling muds, cuttings, and purge water from test pit and well installation; purge water, soil, and other materials from collection of samples; residues (e.g., ash, spent carbon, well development purge water) from testing of treatment technologies and pump and treat systems; contaminated personal protective equipment (PPE); and solutions (aqueous or otherwise) used to decontaminate non-disposable protective clothing and equipment. The management of IDW must ensure protection of human health and the environment and comply with (or waive) regulatory requirements that are applicable or relevant and appropriate requirements (ARAR). **This fact sheet presents an overview of possible IDW management options, discusses the protectiveness requirements and ARARs associated with these options, and outlines general objectives established for IDW management under Superfund.**[1]

The general options for managing IDW (see **Highlight 1**) are collection and either (1) immediate disposal or (2) some type of interim management. Interim management may include storage or other temporary measures. As discussed below, the specific option selected will depend on the type of waste produced, its relative threat to human health and the environment, and other site-specific conditions.

IDW MANAGEMENT REQUIREMENTS

When managing IDW, site managers are required to choose an option that: (1) is protective of human health and the environment and (2) complies with (or waives) ARARs, as described below.

Protectiveness

In determining if a particular management/disposal option is protective, site managers should consider the following:

- The contaminants, their concentrations, and total volume of IDW;
- Media potentially affected (e.g., ground water, soil) under management options;
- Location of the nearest population(s) and the likelihood and/or degree of site access;
- Potential exposures to workers; and
- Potential for environmental impacts.

As a general rule, it will be necessary to use best professional judgment, in light of the site-specific conditions, to determine whether an option is protective of human health and the environment. For example, a site manager may determine that storing IDW temporarily until the final action or returning IDW to its source is protective, based on knowledge that the material poses low risk and/or that the final action will address any risks posed by the wastes and there will be no unacceptable risks in the interim.

Alternatively, if the site includes or is near residential areas, the site is unsecured, and/or contaminants appear to be present at unacceptable levels, it may not be protective to return excavated soil to the source. Storing IDW in containers in an on-site, secure location, or sending it off site immediately may be more appropriate.

Site managers also need to consider the potential effects of IDW management-related activities on environmental media. For example, pouring contaminated purge water on the ground around a well may not be prudent, because such an action could mobilize any hazardous constituents present in the soil or introduce contaminants into clean soil.

Compliance with ARARs

Remedial Investigation/Feasibility Study (RI/FS) and Remedial Design (RD) actions must comply with ARARs "to the extent practicable, considering the exigencies of the situation" (NCP, 55 FR 8756, emphasis added); therefore, it generally will not be necessary to obtain a waiver if an ARAR cannot be attained during these actions. If a site manager determines that, based on site-

[1] Management of treatability study and treatment pilot wastes is discussed in Guide for Conducting Treatability Studies Under CERCLA, Interim Final, December 1989, EPA/540/2-89/058. Information on management of IDW generated during Preliminary Assessments and Site Investigations is provided in Management of Investigation-Derived Waste During Site Investigations, May 1990, EPA/540/G-91/009.

Highlight 1: IDW MANAGEMENT OPTIONS

Type of IDW	Generation Processes*	Management Options
Soil	• Well/test pit installation • Borehole drilling • Soil sampling	• Return to boring, pit, or source immediately after generation • Spread around boring, pit, or source within the AOC+ • Consolidate in a pit (within the AOC) • Send to on-site TDU+ • Send to TDU off site immediately • Store for future treatment and/or disposal
Sludges/sediment	• Sludge pit/sediment sampling	• Return to boring, pit, or source immediately after generation • Send to on-site TDU • Send to TDU off site immediately • Store for future treatment and/or disposal
Aqueous liquids (ground water, surface water, drilling fluids, other wastewaters)	• Well installation/development • Well purging during sampling • Ground water discharge during pump tests • Surface water sampling	• Discharge to surface water • Pour onto ground close to well (non-hazardous waste) • Send to on-site TDU • Send to off-site commercial treatment unit • Send to POTW+ • Store for future treatment and/or disposal
Decontamination fluids	• Decontamination of PPE+ and equipment	• Send to on-site TDU • Evaporate (for small amounts of low contamination organic fluids) • Send to TDU off site immediately • Store for future treatment and/or disposal
Disposable PPE	• Sampling procedures or other on-site activities	• Send to on-site TDU • Place in on-site industrial dumpster • Send to TDU off site immediately • Store for future treatment and/or disposal

* The generation processes listed here are provided as examples. IDW may also be produced as a result of activities not listed here.

\+ AOC: Area of Contamination (AOCs at a site may not yet have been identified at the time of the RI/FS); TDU: Treatment/disposal Unit; POTW: Publicly Owned Treatment Works; PPE: Personal Protective Equipment

specific factors, compliance with an ARAR is practicable but an ARAR waiver is warranted for an RI/FS or RD action, an interim action waiver may be available if the final remedy will attain the ARAR. An action memorandum should be prepared for the waiver, the state given an opportunity to comment, and the decision document placed in the administrative record.

Potential ARARs for IDW at CERCLA sites include regulations under the Resource Conservation and Recovery Act (RCRA) (including both Federal and State underground injection control (UIC) regulations), the Clean Water Act (CWA), the Clean Air Act (CAA), the Toxic Substances Control Act (TSCA), and other State environmental laws. How these various requirements may direct or influence IDW management decisions is described below.

Resource Conservation and Recovery Act (RCRA). Certain sections of the RCRA Subtitle C hazardous waste regulations (e.g., land disposal restrictions and storage restrictions) may be ARARs for IDW should RCRA hazardous waste be identified at a site. (Note that RCRA may be relevant and appropriate even if the IDW is not a RCRA hazardous waste.) A waste is hazardous under RCRA if it is listed as such in 40 CFR 261.31 - 261.33 or if it exhibits one of four characteristics: ignitability, corrosivity, reactivity, or toxicity.

Site managers should not assume that a waste considered to pose a potential risk at a CERCLA site is a listed or characteristic RCRA hazardous waste. **Until there is positive evidence (records, test results, other knowledge of waste properties) that the IDW is a RCRA hazardous waste, site managers should manage it in a protective manner (but not necessarily in accordance with Subtitle C requirements).** Business records or facility processes should be examined to determine whether RCRA listed wastes were generated and are present in the IDW. For characteristic wastes, site managers should rely on testing results or on knowledge of the material's properties. If best professional judgment and available information indicate that, for protectiveness reasons (or because RCRA requirements are relevant and appropriate), IDW is best managed as a "hazardous waste," management in accordance with Subtitle C requirements is prudent, regardless of whether it is known to be a RCRA waste.

If aqueous liquid IDW is considered a RCRA hazardous waste, the site manager should determine whether the Domestic Sewage Exclusion (DSE) applies to the discharge of that IDW to a POTW. The RCRA DSE exempts domestic sewage and any mixture of domestic sewage and other wastes that passes through a sewer system to a POTW for treatment from classification as a solid waste and, therefore, as a RCRA hazardous waste (40 CFR 261.4).

- Land Disposal Restrictions

If IDW is determined to be a RCRA hazardous waste and subject to the land disposal restrictions (LDRs), "land disposal" of the IDW will be prohibited unless specified treatment standards are met (see Superfund LDR Guides #5 and #7, Determining When LDRs Are Applicable to CERCLA Response Actions and Determining When LDRs Are Relevant and Appropriate to CERCLA Response Actions, OSWER Directive 9347.3-05FS and 9347.3-08FS, June 1989 and December 1989 and the NCP, 55 FR 8759, March 8, 1990). "Land disposal" occurs when wastes from different AOCs are consolidated into one AOC; when wastes are moved outside an AOC (for treatment or storage) and returned to the same or a different AOC; or when wastes are excavated, placed in a separate hazardous waste management unit such as an incinerator or tank within the AOC, and then redeposited into the AOC.

Storing IDW in a container ("a portable device in which a material is stored, transported, treated, disposed of, or otherwise handled" (40 CFR 260.10)) within the AOC and then returning it to its source, however, is allowable without meeting the specified LDR treatment standards. Under the definition of "hazardous waste management unit" (40 CFR 260.10), EPA states that "a container alone does not constitute a unit; the unit includes the containers and the land or pad upon which they are placed." Therefore, returning IDW that has been stored in containers (not tanks or other RCRA-regulated units) within the AOC to its source does not constitute land disposal, as long as containers are not managed in such a manner as to constitute a RCRA storage unit as defined in 40 CFR 260.10. In addition, sampling and direct replacement of wastes within an AOC do not constitute land disposal.

- Storage

Subtitle C outlines the storage requirements for RCRA hazardous wastes. Under RCRA, "storage" is defined as "the holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere" (40 CFR 260.10).

On-site Superfund actions are only required to comply with the substantive standards of other laws (see 40 CFR 300.5, definitions of applicable or relevant and appropriate requirements). Superfund sites are also exempt from permit requirements under CERCLA §121(e). Therefore, site managers are not required to comply with administrative requirements triggered by RCRA storage deadlines (e.g., contingency planning, inspections, recordkeeping). Generally equivalent administrative activities are undertaken at Superfund sites, however, under existing Superfund management practices.

Site managers storing known RCRA hazardous waste must comply with the substantive, technical requirements of 40 CFR Parts 264 and 265 Subparts I (containers), J (tanks), and L (waste piles), to the extent practicable. (See **Highlight 2** for a summary of these technical requirements for each type of unit). In addition, the ground-water monitoring requirements of 40 CFR Parts 264 and 265 Subpart F are potential ARARs, and to the extent they are determined to be ARARs at a site, they should be attained to the extent practicable (or waived). (In many cases, ground-water monitoring conducted during the RI/FS will provide protection equivalent to the Subpart F requirements.)

[NOTE: Under the LDRs, restricted RCRA hazardous waste may not be stored at a site unless the storage is solely for the purpose of accumulating sufficient quantities of the waste to facilitate proper disposal, treatment, or recovery (see 40 CFR 268.50). **Generally, storing IDW until a final disposal option is**

Highlight 2:
EXAMPLES OF RCRA TECHNICAL STORAGE REQUIREMENTS*

RCRA storage requirements, applicable to both less-than-90-days generators and permitted or interim status storage facilities, may include the following substantive requirements:

Containers 40 CFR 264 Subpart I and 265 Subpart I

- Containers must be in good condition
- Wastes must be compatible with container
- Container must be closed during storage
- Container storage areas must have a containment system that can contain 10 percent of the volume of containers or of the largest container
- Spilled or leaked waste must be removed from the collection area as necessary to prevent overflow

Tanks 40 CFR 264 Subpart J and 265 Subpart J

- Tanks must have a secondary containment system that includes a liner, a vault, a double-walled tank, or an equivalent device (applies only to certain tanks)

Waste Piles 40 CFR 264 Subpart L and 265 Subpart L

- Waste piles must have a liner and a leachate collection and removal system
- Owners/operators must have a run-on control system to prevent flow onto the active portion of the pile during peak discharge from at least a 25-year storm
- Owners/operators must have a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm

* This is a partial list of substantive requirements. For more detail, see 40 CFR Part 264 and 265.

selected in a Record of Decision (ROD) and implemented during the remedial action is allowable storage under the RCRA LDR storage prohibition.]

- Recordkeeping and Manifesting

If hazardous wastes are sent off site, the site manager must comply with both administrative and substantive elements of the RCRA generator requirements of 40 CFR Part 262 and LDR notification and certification requirements of Part 268. (For example, a site manager must prepare an LDR notification and certification when restricted wastes are sent off site to a land disposal facility.) These standards include requirements such as manifests for shipping waste that list all hazardous waste listings and characteristics applicable to the waste (see 40 CFR 262.11), packaging and transport requirements, and recordkeeping requirements.

If the LDRs are applicable, the following information should be collected and available before the removal of wastes to an off-site disposal facility: EPA hazardous waste number, LDR treatment standards, manifest number for the waste shipment, and waste analysis data.

- Underground Injection Control (UIC) Program

Under the UIC regulations, RCRA hazardous wastes may be injected into Class I permitted wells. In some cases, hazardous liquids, such as extracted ground water from pump and treat operations, may be injected into a Class IV UIC well. For example, ground water contaminated with RCRA hazardous wastes may be injected into Class IV permitted wells if it is part of a CERCLA response action or a RCRA corrective action and if it has been treated to "substantially reduce hazardous constituents prior to such injection..." (RCRA § 3020(b)). (See Applicability of Land Disposal Restrictions to RCRA and CERCLA Ground Water Treatment Reinjection, OSWER Directive #9234,1-06, December 1989.)

- Non-RCRA Hazardous Wastes

Some non-RCRA hazardous waste may be subject to management requirements under Subtitle D of RCRA as solid wastes. Subtitle D regulates disposal of solid waste in facilities such as municipal landfills. Therefore, non-RCRA hazardous IDW, such as decontaminated PPE or equipment, may need to be disposed of in a Subtitle D facility (depending on State requirements).

Clean Water Act (CWA). Discharges of aqueous IDW to surface water and publicly owned treatment works (POTWs) may be required to comply with CWA Federal, State, and local requirements. Requirements to be met may include water quality criteria, pre-treatment standards, State water quality standards, and NPDES permit conditions. Direct discharges to on-site waters are subject only to substantive requirements, while discharges to POTWs and other off-site discharges must comply with both substantive and administrative CWA requirements (including permitting requirements). (See Guide to Discharging CERCLA Aqueous Wastes to POTWs, June 1991 and CERCLA Compliance with the CWA and SDWA, #9234.2-06FS, January 1991.)

Toxic Substances Control Act (TSCA). If IDW contains PCBs, TSCA treatment and/or disposal requirements may apply during its management. TSCA requirements regulate the disposal of material contaminated with PCBs at concentrations of 50 ppm or greater as found on site (i.e., based on sample analysis and not the PCB concentration of the source material {e.g., transformer fluid}). (See PCB Guidance Manual, EPA/540/G-90/007, August 1990.) In addition, TSCA storage requirements may apply that limit the time that PCBs may be stored to one year. Furthermore, if PCB materials are mixed with a RCRA hazardous waste, they may be regulated by the LDR California list prohibitions. (See RCRA sections 3004(d)(2)(D) and (E).)

Department of Transportation (DOT) requirements. Where IDW will be disposed of off site or transported on public roads to a site,

DOT requirements for containerizing, labeling, and transporting hazardous materials and substances may apply.

State requirements. Promulgated State regulations that are legally enforceable, timely identified, and more stringent than Federal regulations may be potential ARARs for IDW managed on site. Substantive requirements of State law that may be ARARs for IDW management include State water quality standards, direct discharge limits, and RCRA requirements (including underground injection control regulations) promulgated in a State with an authorized RCRA hazardous waste management program (as well as programs authorized by State laws). Off-site, substantive and administrative requirements of State law may apply.

Off-Site Policy. In addition to complying with requirements of Federal and State laws, all off-site disposal of wastes must comply with CERCLA section 121(d)(3) and the CERCLA Off-Site Policy (OSWER Directive No. 9834.11 (November 13, 1987)). The Off-Site Policy establishes criteria for selecting an appropriate treatment, storage, or disposal facility (TSDF), including release criteria for all facilities that receive wastes from CERCLA-authorized or funded response actions. In addition, receiving facilities must be in compliance with all "applicable laws."

Before shipping wastes off site, approval should be obtained for the proposed disposal facility from EPA's Regional Off-Site Policy Coordinator. In addition, EPA has adopted a policy for Superfund wastes shipped out of State that written notification should be provided to receiving States (OSWER Directive 9330.2-07, September 14, 1989).

GENERAL OBJECTIVES FOR IDW MANAGEMENT

In addition to the two requirements of protectiveness and compliance with ARARs to the extent practicable (on site) or compliance with applicable law (off site), EPA has identified two general objectives that Superfund site managers should consider when managing IDW: (1) minimization of IDW generation; and (2) management of IDW consistent with the final remedy for the site. The extent to which these objectives can be achieved is highly dependent on site-specific circumstances.

IDW Minimization

Site managers should strive to minimize the generation of IDW to reduce the need for special storage or disposal requirements that may result in substantial additional costs yet provide little or no reduction in site risks relative to the final remedial action. Generation of IDW can be minimized through proper planning of all remedial activities that may generate IDW, as well as through use of screening information from the site inspection. The potential problems of managing IDW should be a factor in choosing an investigative method. Site managers may wish to consider techniques such as replacing solvent-based cleaners with aqueous-based cleaners for decontamination of equipment, reuse of equipment (where it can be decontaminated), limitation of traffic between clean and hot zones, and drilling methods and sampling techniques that generate little waste. Examples of such techniques include using gridding techniques to minimize the number of test pits or using soil borings instead of test pits. Alternative drilling and subsurface sampling methods may include the use of small diameter boreholes, as well as borehole testing methods such as a core penetrometer instead of coring. Site managers should also be careful to keep hazardous wastes separate from nonhazardous wastes.

Management Consistent with Final Remedy

Most IDW (with the exception of non-indigenous IDW) generated during the course of an investigation are intrinsic elements of the site. If possible, IDW should be considered part of the site and should be managed with other wastes from the site, consistent with the final remedy. This will avoid the need for separate treatment and/or disposal arrangements.

Because early planning for IDW management can prevent unnecessary costs and the use of treatment or disposal capacity, IDW management should be considered as early as possible during the remedial process. A key decision to be made is whether the waste will best be treated/disposed of immediately or addressed with the final remedy. If addressed with the final remedy, IDW volumes should be considered in the FS. In addition, when IDW is stored on site, it should be managed as part of the first remedial action/operable unit that addresses the affected media.

SELECTION OF IDW DISPOSAL OPTIONS

The following sections present the Agency's presumptions for IDW management that have been established based on the above considerations. The actual option selected should be based upon best professional judgment and should take into account the following factors:

- The type and quantity of IDW generated (sludge/soil, aqueous liquid, non-indigenous IDW);
- Risk posed by managing the IDW on site (e.g., based on site access controls, contaminant concentrations);
- Compliance with ARARs, to the extent practicable (on site);
- IDW minimization; and
- Whether the final remedy is anticipated to be an off-site or on-site remedy (or this information is unknown) and whether IDW can be managed consistent with the final remedy.

Off-site Final Remedies

If a site manager believes that the final remedy will involve off-site disposal of wastes, EPA's presumption is to manage the IDW as part of the remedial action addressing the waste/medium. Thus, until the final action, the IDW may be stored (e.g., drummed, covered waste pile) or returned to its source. However, the management option selected should also take into account any protectiveness concerns, ARARs, and other relevant site-specific factors (e.g., weather, storage space, and public concern/ perceptions).

There are several potential reasons why it may be advisable to store IDW until the final action. First, because wastes at the site will be shipped off site eventually, returning IDW (especially sludges and soil) to its source would require that it be excavated again. Thus, site managers may consider it practical to containerize IDW as soon as it is generated. Second, storing IDW in containers may be more protective than returning it to its source. Third, because off-site actions may trigger such requirements as the LDRs, temporary storage will eliminate the need to meet these additional requirements until the final remedy.

In some cases, circumstances may lead site managers to choose to return the IDW to its source. This may be appropriate if it is determined that returning IDW to the source is protective and that storage at the site is not possible or practicable (i.e., given State or community concerns). In other cases, long-term storage may not be protective, and immediate off-site disposal may be a better option.

Off-site Remedy

Example: A site involves volatile organic RCRA hazardous wastes that will likely be sent off site for final treatment and disposal. Site conditions are such that temporary storage of IDW is considered protective until the remedial action begins. Because off-site disposal will trigger RCRA disposal requirements such as the LDRs and immediate containerization would be more protective than redepositing into the source area at the time of sampling, the site manager decides to containerize the IDW (and comply with RCRA substantive technical tank and container standards) until the final action is initiated.

On-site Final Remedies (or Final Management in an Unknown Location)

When final management of wastes is likely to occur on site, the management presumptions vary depending on the type of IDW produced.

Sludge/soil

Generally, the Agency expects sludge or soil IDW will be returned to its source if short-term protectiveness is not an issue. The reason behind this presumption is that IDW that may pose a risk to human health and the environment in the long term will be addressed by the final action. **Storage of RCRA hazardous IDW in containers within the AOC prior to returning it to the source will not trigger the LDRs, as long as the containers are not managed in such a way as to constitute a RCRA storage unit as defined in 40 CFR 260.10.** Therefore, it may be possible to store IDW temporarily before redisposing of it. However, EPA believes that, in many cases, returning sludges and soils to their source immediately will be protective and will avoid potentially increased costs and requirements associated with storage. Site-specific decisions on how to manage sludge and soil IDW may ultimately vary from the presumption based on protectiveness, ARARs, and/or community concerns.

Sludge/Soil

Example 1: The soil at a site contains wastes that are expected to be stabilized on site during the final remedial action. The site manager determines that sending soil IDW off site is not cost-effective, because off-site disposal would involve testing and transport costs for a relatively small amount of waste. Instead, knowing that the site is secure and that redisposing the waste at the source will not increase site risk or violate ARARs, the site manager decides to return soil IDW to the source area from which it originated.

Example 2: A site manager determines that returning highly contaminated PCB wastes to the ground at a site is not protective because of the potential risks associated with the material; instead, the site manager chooses to drum the waste and send it off site (in compliance with TSCA). (Off-site disposal may occur immediately or at a later date.)

Example 3: Soil IDW contaminated with a RCRA hazardous waste is generated from a soil boring. The site manager decides to put the IDW back into the borehole immediately after generation, but ensures that site risks will not be increased (e.g., the contaminated soil will not be replaced at a greater depth than where it was originally so that it will not contaminate "clean" areas) and that the contamination will be addressed in the final remedy.

Aqueous liquids

EPA has not established a presumption for the management of aqueous liquid IDW (e.g., ground water). Site managers should determine the most appropriate disposal option for aqueous liquids on a **site-specific** basis. Parameters to consider, especially in making the protectiveness decision, include the volume of IDW, the contaminants present in the ground water, the presence of contaminants in the soil at the site, whether the ground or surface water is a drinking water supply, and whether the ground-water plume is contained or moving. Special disposal/handling may be needed for drilling fluids because they may contain significant solid components. Examples of aqueous liquid management decisions considering these factors are presented in the box on the next page.

Non-indigenous IDW

Non-indigenous IDW (e.g., sampling materials, disposable PPE, decontamination fluids) should be stored until the final remedy or disposed of immediately. If contaminated, such waste may not be disposed of onto the ground because such an action would add contamination that was not present when activities began at the site (e.g., solvents used for decontamination). If non-indigenous IDW is contaminated with RCRA hazardous waste, it must be managed in accordance with RCRA Subtitle C requirements. Otherwise, site

Aqueous Liquids

Example 1: A site manager has large volumes of ground water IDW and does not know if it is contaminated. Pouring this IDW on the ground would not be protective, because it may contaminate previously uncontaminated soil or may mobilize contaminants that are present in the soil. Therefore, the site manager stores the water in a mobile tank until a determination is made as to whether the water and soil are contaminated or until the final action.

Example 2: IDW is generated from the sampling of background, upgradient wells. Because there are no community concerns or evidence of any soil contamination from other sources, the site manager decides to pour this presumably uncontaminated IDW on the ground around the well.

Example 3: Purge water from a deep aquifer is known to be contaminated with a RCRA hazardous waste. At this site, if this water were poured on the ground, it could contaminate a previously uncontaminated shallow aquifer that is a potential drinking water source and would have to comply with the LDRs. The site manager decides to containerize the water within the AOC and store it until the final remedy.

managers may generally dispose of it in an on-site dumpster (for PPE).

Non-indigenous IDW

Example 1: Disposable PPE (e.g., gloves, shoe covers) becomes contaminated with RCRA hazardous waste during the field investigation. The site manager containerizes and disposes of this IDW in compliance with RCRA Subtitle C requirements.

Example 2: Disposable equipment becomes contaminated during a field investigation. The site manager decontaminates them and sends them to a Subtitle D facility.

COMMUNITY CONCERNS

Residents of communities near a CERCLA site, local governments, or States may have concerns about certain disposal methods or long-term storage of IDW at the site. As with all CERCLA activities, site managers should evaluate community concerns regarding disposal of IDW in deciding what action to take. For example, if a community is concerned about the direct discharge of IDW water to surface water on site, site managers may want to consider sending the water to a POTW, if one is located nearby. In some instances, it may be appropriate to prepare fact sheets, include options in other community relations documents, or explain IDW management decisions at public meetings prior to actions.